Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A method of correcting coordinate measurement errors produced by dynamic forces distorting moving ~~part~~parts of a machine, the method comprising~~comprises~~:

measuring acceleration values of ~~the~~a moving part of the machine;

using position measuring devices of the machine to obtain first signals indicative of a displacement of the moving part; and

applying a data fusion algorithm to obtain corrected values for a measured displacement of the moving part~~,~~ wherein the data fusion algorithm double integrates the measured acceleration values to produce second signals indicative of a ~~displacement~~distortion from a nominal position of the ~~machine~~moving part due to ~~dynamic forces distorting the moving part of the machine~~accelerations and combines the second signals with the first signals ~~indicative of the displacement of the moving part~~.

2. (Previously Presented) A method according to claim 1, wherein the acceleration values of said moving part are measured along a linear axis of the machine.

3. (Previously Presented) A method according to claim 1, wherein the acceleration values of said moving part are angular accelerations.

4. (Previously Presented) A method according to claim 1, wherein the step of measuring the acceleration values of a moving part of the machine includes measuring the accelerations both of the moving part and of at least one of said position measuring devices along an axis of the machine.

5. (Previously Presented) A method according to claim 1, wherein the data fusion algorithm includes a scaling step wherein the second signals produced by double integration of

the measured acceleration values are processed in a scaling matrix in order to produce data with the same measurement units as those produced by the position measuring devices of the machine.

6. (Currently Amended) A method according to claim 1, wherein the data fusion algorithm includes a filtering step, wherein the second signals indicative of ~~the~~a ~~displacement~~distortion of the moving part ~~of the machine~~ due to ~~the dynamic forces distorting the moving part of the machine~~accelerations thereof are filtered through a high pass filter machine.

7. (Previously Presented) A method according claim 1, wherein the data fusion algorithm includes a filtering step, wherein the first signals indicative of the displacement of the moving part produced by the position measuring devices of the machine are filtered through a low pass filter.

8. (Previously Presented) A method according to claim 1, wherein both linear and angular accelerations of the moving part are measured and the data fusion algorithm processes the angular accelerations of the moving part to calculate a direction matrix which describes the orientation of the axes of the linear accelerometers relative to the linear axes of the machine.

9. (Original) A method according to claim 1 wherein, the moving part of the machine comprises a measuring probe carried by the machine.

10. (Original) A method according to claim 1 wherein, the moving part of the machine comprises a probe head carried by the machine and to which a measuring probe is connected.

11. (Previously Presented) A method according to claim 4, wherein the data fusion algorithm includes the step of double integrating the difference between accelerations of the moving part and of the position measuring device in the direction of said axis.

12. (Previously Presented) A data fusion algorithm for correcting measurement errors produced by position measuring devices on a movable machine part comprising:

(a) inputting a first signal which is indicative of the accelerations of a moving part of a machine;

(b) integrating the first signal twice to obtain a displacement signal indicative of displacement of the moving part caused by acceleration effects of a movement;

(c) normalizing and resolving the doubly integrated first signal;

(d) inputting a second signal from position measuring devices of a machine which is indicative of a displacement of the movable machine part caused by the movement;

(e) adding the normalized and resolved first signal to the second signal to produce a corrected position signal.

13. (Previously Presented) A data fusion algorithm according to claim 12 including a filtering step wherein the signals indicative of the displacement of the moving part of the machine due to the accelerations thereof are filtered through a high pass filter prior to being added to the second signal.

14. (Previously Presented) A data fusion algorithm according to claim 13 comprising:

inputting a third signal which is indicative of the accelerations of the position measuring device;

integrating the third signal twice to obtain a displacement signal indicative of displacement of the position measuring device caused by acceleration effects of a movement;

normalizing and resolving the third signal;

inverting the normalized and resolved third signal; and

adding the inverted third signal to the normalized and resolved first signal.

15. (Previously Presented) A data fusion algorithm according to claim 12 including:

inputting a third signal which is indicative of the accelerations of the position measuring device; and

subtracting the third signal from the first signal prior to integrating the first signal twice.

16. (Previously Presented) A data fusion algorithm according to claim 12 comprising:

inputting a fourth signal indicative of angular accelerations of the moving part caused by acceleration effects of a movement;

creating a direction matrix which describes the orientation of the moving part with respect to an axis of the machine;

applying the direction matrix between steps (a) and (b) to transform translational acceleration information of the moving part into the linear axes of the machine.

17. (Previously Presented) A data fusion algorithm according to claim 16 wherein the fourth signal is additionally integrated twice and scaled to give a signal indicative of displacement of the moving part from a nominal center.

18. (Previously Presented) A data fusion algorithm according to claim 17 comprising:

inputting a fifth signal indicative of angular acceleration of the moving part caused by internal torque;

integrating the fifth signal twice to obtain a rotational displacement signal indicative of the displacement of the moving part caused by internal torque during a movement;

adding the doubly integrated fifth signal to the fourth signal.